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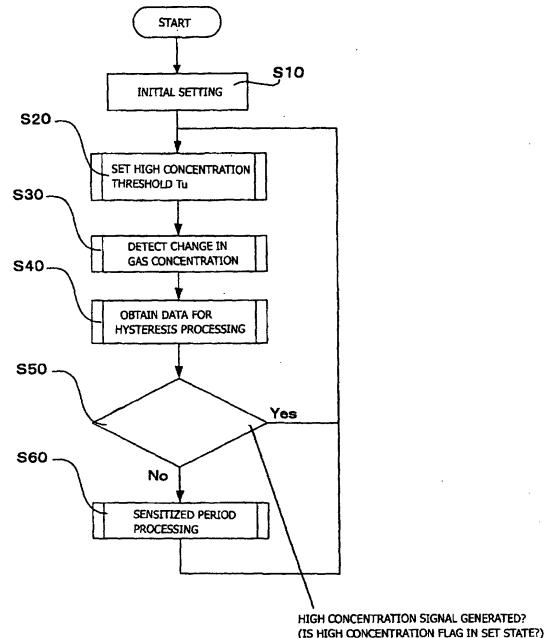
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### (54) Gas detection and automatic ventilation system for vehicle

(57) The present invention provides a gas detection apparatus (10), which uses a gas sensor element (11) whose sensor resistance ( $R_s$ ) changes in accordance with the concentration of an oxidative gas, obtains a sensor output value ( $S(n)$ ) corresponding to the sensor resistance ( $R_s$ ), and performs predetermined processing to thereby generate a low concentration signal or a high concentration signal in accordance with changes in the concentration of the oxidative gas. When the detection sensitivity for an increase in the concentration of the oxidative gas drops stemming from a hysteresis phenomenon caused by adsorption of gas molecules to the gas sensor element (11), a sensitized period, in which the high concentration threshold is lowered, is provided, whereby an increase in gas concentration can be detected on the basis of a slight increase in the sensor output value.

FIG.3





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## EUROPEAN SEARCH REPORT

Application Number

EP 03 02 0695

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	WO 01 92864 A (NGK SPARK PLUG CO ; KIMOTO YUJI (JP); MATSUOKA TOSHIYA (JP)) 6 December 2001 (2001-12-06) * figures 1-24 * & EP 1 286 155 A (NGK SPARK PLUG CO, LTD) 26 February 2003 (2003-02-26) ---	1,20-22, 26,30,31	G01N33/00 B60H3/00
X	PATENT ABSTRACTS OF JAPAN vol. 2002, no. 02, 2 April 2002 (2002-04-02) & JP 2001 281185 A (NGK SPARK PLUG CO LTD), 10 October 2001 (2001-10-10) * abstract *	1,20-22, 26,30,31	
X	PATENT ABSTRACTS OF JAPAN vol. 2002, no. 06, 4 June 2002 (2002-06-04) & JP 2002 055068 A (NGK SPARK PLUG CO LTD), 20 February 2002 (2002-02-20) * abstract *	1,20-22, 26,30,31	
A	PATENT ABSTRACTS OF JAPAN vol. 1999, no. 05, 31 May 1999 (1999-05-31) & JP 11 042925 A (DENSO CORP; TOYOTA MOTOR CORP), 16 February 1999 (1999-02-16) * abstract *	1-32	TECHNICAL FIELDS SEARCHED (Int.Cl.7) G01N B60H
P,X	EP 1 316 799 A (NGK SPARK PLUG CO) 4 June 2003 (2003-06-04) * the whole document *	1,20-22, 26,30,31	
<p>The present search report has been drawn up for all claims</p>			
Place of search	Date of completion of the search	Examiner	
MUNICH	18 November 2003	Purdie, D	
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons &amp; : member of the same patent family, corresponding document</p>			

ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.

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 The members are as contained in the European Patent Office EDP file on  
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18-11-2003

Patent document cited in search report		Publication date		Patent family member(s)	Publication date
WO 0192864	A	06-12-2001	CA EP WO JP US	2380782 A1 1286155 A1 0192864 A1 2002055068 A 2002154019 A1	06-12-2001 26-02-2003 06-12-2001 20-02-2002 24-10-2002
JP 2001281185	A	10-10-2001		NONE	
JP 2002055068	A	20-02-2002	CA EP WO US	2380782 A1 1286155 A1 0192864 A1 2002154019 A1	06-12-2001 26-02-2003 06-12-2001 24-10-2002
JP 11042925	8	A		NONE	
EP 1316799	A	04-06-2003	EP JP US	1316799 A2 2003227807 A 2003110828 A1	04-06-2003 15-08-2003 19-06-2003